

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
23 December 2004 (23.12.2004)

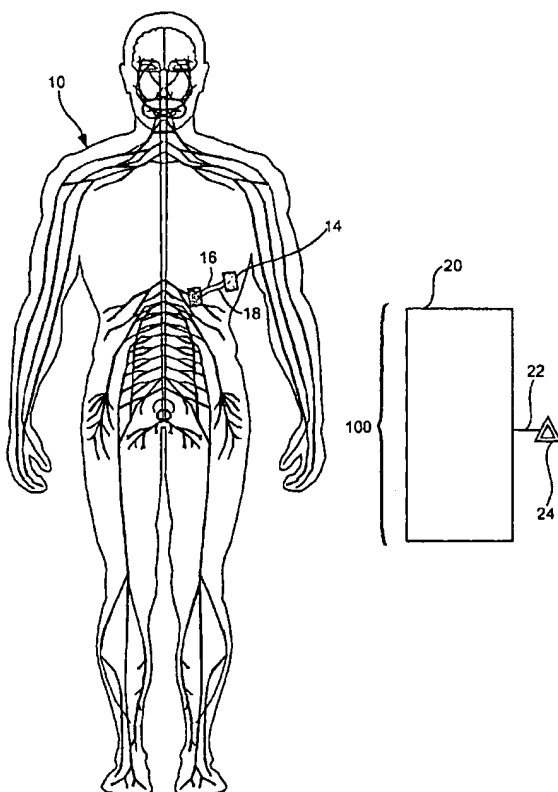
PCT

(10) International Publication Number
WO 2004/110551 A3

- (51) International Patent Classification⁷: **A61N 1/00**
- (21) International Application Number: **PCT/US2004/016592**
- (22) International Filing Date: **25 May 2004 (25.05.2004)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
- | | | |
|------------|--------------------------------|----|
| 60/477,070 | 9 June 2003 (09.06.2003) | US |
| 60/482,593 | 24 June 2003 (24.06.2003) | US |
| 60/494,260 | 11 August 2003 (11.08.2003) | US |
| 10/661,368 | 12 September 2003 (12.09.2003) | US |
- (71) Applicant (for all designated States except US): **PALO ALTO INVESTORS [US/US]; 470 University Avenue, Palo Alto, CA 94031 (US).**
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **YUN, Anthony, Joonkyoo [US/US]; 912 Dennis Drive, Palo Alto, CA 94303 (US). LEE, Patrick, Yuarn-Bor [US/US]; 330 Highland Avenue, Piedmont, CA 94611 (US).**
- (74) Agent: **TALL, Susan, C.; Bozicevic, Field & Francis, LLP, 1900 University Avenue, Suite 200, East Palo Alto, CA 94303 (US).**
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.**

[Continued on next page]

(54) Title: **TREATMENT OF CONDITIONS THROUGH ELECTRICAL MODULATION OF THE AUTONOMIC NERVOUS SYSTEM**



(57) Abstract: Methods are provided for treating a subject for a condition caused by an abnormality in the subject's autonomic nervous system. In accordance with the subject methods, at least a portion of a subject's autonomic nervous system is electrically modulated to increase the parasympathetic activity/sympathetic activity ratio in a manner that is effective to treat the subject for the condition. Certain embodiments include electrically modulating at least a portion of a subject's autonomic nervous system by inhibiting and/or increasing activity in at least a portion of the subject's autonomic nervous system. The subject methods find use in the treatment of a variety of different conditions, where such conditions include various disease conditions. Also provided are systems and kits for use in practicing the subject methods.



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) **Date of publication of the international search report:**
12 May 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/16592

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A 61N 1/00

US CL : 607/002

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 607/2-59

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,522,854 A (IDEKER ET AL) 04 JUNE 1996 (04.06.1996), see column 4, line 61.	1-11, 21, 24, 26, 31-35, 39 ----- 40-52
X	US 2002/0116030 A1 (REZAI) 22 AUGUST 2002 (22.08.2002), see entire document.	18-20, 22-23
Y, E	US 6,628,987 B1 (HILL ET AL) 30 SEPTEMBER 2003 (30.09.2003), see columns 12-16.	40-44, 48-52

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

02 March 2005 (02.03.2005)

Date of mailing of the international search report

10 MAR 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Linda J Sholl

Telephone No. (571) 272-4391